

POWER SOURCE[®]

A Corporate Publication of Santee Cooper[®]

FALL 2003

*Santee Cooper Combustion
Byproducts — Helping Build the
New Cooper River Bridge*



C.R. Bard: Leading Health-Care Products Provider | Striped Bass: Still the Big Catch | Santee Cooper Inks Long-Term Alcoa Contract

MAKING LEMONADE

"If you have lemons, make lemonade." That age-old adage offers great advice for turning liabilities into assets, for converting adversity into opportunity, for turning defeat into victory. Those opportunities are found throughout life and throughout the world of business and industry.

Santee Cooper and other utilities have an environmental responsibility and face an environmental challenge for doing what they can to preserve and improve the quality of the air, water, land and other natural resources that they use or with which they interact.

For decades, Santee Cooper faced the costly challenge of managing vast quantities of waste materials that in one form or another were byproducts of fossil-fuel generation.

When coal is burned to produce 1,000 degrees F plus heat that boils water and produces steam, residue known as fly ash and bottom ash are collected from

the small fraction of unburned fuel. Until technology turned things around, those "waste products" had to be collected and stored on site in a manner that isolated them from the environment. This meant costly collection, pumping and storage — an expensive process in all respects.

In the 1970s, Santee Cooper began exploring potential uses of the combustion byproducts. Uses were found and markets were developed for those materials. Today, virtually all of those materials are marketed, and the unused waste flow has been reduced from more than 90 percent to less than 5 percent over the past three decades.

Fly ash is marketed to cement companies in Holly Hill and Harleyville and is used in making a superior grade of cement. In addition, a conversion in the sulfur dioxide scrubbing process produces calcium sulfate, which is artificial gypsum, another product used by the cement companies.



T. Graham Edwards
Chairman — Board of Directors

T. Graham Edwards

I hope you will enjoy the feature in this issue on how one of the byproducts of combustion is being used as a strengthening material in the concrete poured for the new Cooper River bridge.

This innovative use of a combustion product produced in generating Santee Cooper power is just one example of how this state-owned utility makes a positive impact on both the economy and environment of South Carolina.



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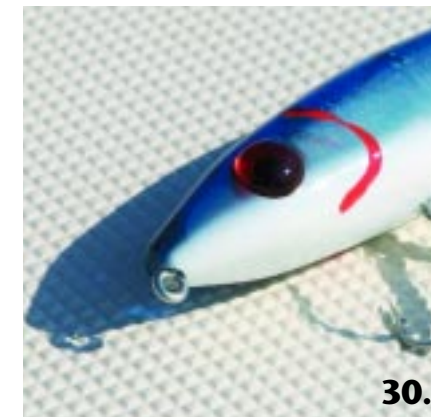
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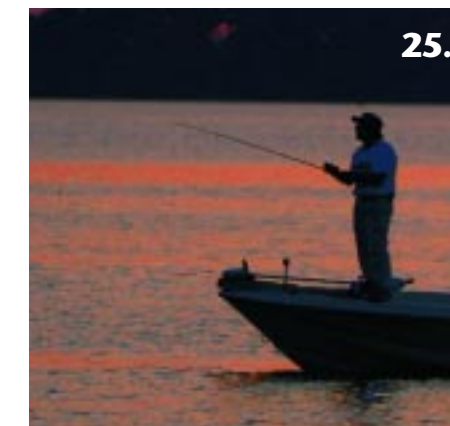


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Cover: Changing the Charleston landscape, construction proceeds about one year ahead of schedule on the new Arthur Ravenel Jr. Bridge, which will replace the existing John P. Grace Memorial Bridge and the Silas M. Pearman Bridge. Santee Cooper-produced fly ash is a major ingredient in the concrete mix for the \$531 million project.

Printed on recycled paper.

COMBUSTION BYPRODUCTS: RECYCLING THAT'S HELPING BUILD SOUTH CAROLINA...

Including Charleston's New Cooper River Bridge

Santee Cooper has followed the old adage of “turning lemons into lemonade” by putting to good use its leftover ash — the combustion byproduct that is left over after burning coal to generate electricity.

This ash can make useful products, such as cement, redi-mix concrete and concrete blocks.

Santee Cooper provides fly ash and bottom ash for the manufacturing processes that supply materials to companies that use it in the construction of homes, schools and businesses here in South Carolina and throughout the rest of the Southeast.

“Our annual recycling of combustion products was 47 percent in 2002, 55 percent in 2002 and we project that percentage to be 75 percent this year,” said Tommy Edens, Santee Cooper’s administrator of combustion products utilization. “I’ve set a personal goal of 100 percent.”



Left: Looking up at one of the two diamond-shaped support towers for the new Arthur Ravenel Jr. Bridge. Over 30,000 tons of Santee Cooper-produced fly ash are blended into the 300,000 cubic yards of concrete used in construction of the \$531 million project.

Above: Tommy Edens holds one of the 23-pound lightweight concrete blocks made using Santee Cooper fly ash. Last year, over six million concrete blocks were manufactured using Santee Cooper fly ash. Edens is administrator of combustion products utilization for the state-owned electric and water utility.

This isn't just wishful thinking. The way things are going, Edens may just make that lofty goal a reality. To tell this recycling story, one must go back to the "bread and butter" of Santee Cooper: generating electricity that is the direct and indirect source of power used by 1.7 million of the state's 4 million people.

The majority of Santee Cooper's generation mix, just more than 78 percent, comes from coal-fired generation. This electricity is produced at four large-scale generating stations in Berkeley, Georgetown and Horry counties.

These stations have a voracious appetite for coal, the fuel that makes them run. Last year, Santee Cooper burned 7.3 million tons of coal and is projected to burn an equal amount this year.

Burning coal produces ash, and something must be done with that ash. For electric utilities, that "something" has traditionally meant constructing ash ponds or landfills where the generating stations are located. The ash is filtered from the process and sluiced through large pipes to the ash holding ponds or stored dry in landfills. And for the longest time, that was it. The ash just sat there. And more ash was coming in all the time.

**"Our annual recycling of combustion products was 47 percent in 2002... and we project that percentage to be 75 percent this year. I've set a personal goal of 100 percent."
— Tommy Edens**



The coal pile at Winyah Generating Station near Georgetown. The combustion of more than seven million tons of coal annually at four generating sites results in the production of about 700,000 tons of fly ash suitable for use in making cement, concrete and other products.

Converting Ashes into Assets

But nearly 30 years ago, Santee Cooper began viewing ash in a different light. In late 1974, Santee Cooper began supplying fly ash to the Santee Portland Cement Co. located in Holly Hill. This ash came from Units 1 and 2 at the Jefferies Generating Station near Moncks Corner.

"Instead of this fly ash going to the ash ponds at Jefferies, we were able to recycle it with the cement company," Edens said. "It was a start."

Another turning point came in 1994 when a consultant suggested ways the state-owned utility could improve its ash utilization. At that time, only about 5 percent of its ash was recycled.

Since that time, Santee Cooper has expanded its ash recycling activities at two generating facilities — Winyah Generating Station near Georgetown and Cross Generating Station in Pineville. Today, Santee Cooper sends more than 200,000 tons of fly ash annually to cement companies. Winyah, a carbon-recycling facility or "carbon burnout" (CBO) facility, began operation in October 2002. In addition, all ash produced at Grainger Generating Station in Conway, approximately 30,000 tons, goes to Winyah for processing.

The CBO facility is owned by SEFA Group, formerly Southeastern Fly Ash, a Moncks Corner-based firm. SEFA burns out the excess carbon from Winyah and Grainger's high-carbon ash, converting it into approximately 230,000 tons of low-carbon ash annually. The finished product is used in the manufacturing of redi-mix concrete. The heat recovered from the carbon burnout process is returned to the boiler, thus providing a fuel savings.





Trucks line up at Winyah Generating Station to load fly ash for delivery to cement plants in the Holly Hill and Harleyville areas and to the Cooper River Bridge Construction Project in Charleston.

This facility is producing more than 30,000 tons of low-carbon ash that is a major ingredient in the more than 300,000 cubic yards of concrete being used in the construction of the new Cooper River bridge in Charleston Harbor.

“All low-carbon quality ash meeting redi-mix standards goes to SEFA,” Edens said. “The fly ash not meeting those standards goes to the cement companies in the Holly Hill area such as Holcim, Giant and Lafarge.”

Creating “Synthetic” Gypsum

There is another recycling success story at Cross Station. Several years ago, the sulfur dioxide (SO₂) scrubbing process was modified to allow for conversion of calcium sulfite to calcium sulfate, also known as synthetic gypsum. Gypsum is another key ingredient in making cement and a key ingredient used in the manufacturing of building materials commonly known as “sheetrock” or “wallboard.”

Making both of these uses a “green” building component. The calcium sulfite material previously was combined with ash and placed in an on-site landfill, making it a useless and costly waste material.

Ash Glossary

Fly Ash—Microscopic-sized, perfectly round particles of ash produced from the burning of coal in a coal-fired power plant. Fly ash contains aluminum, iron and silicon oxides.

Bottom Ash—Solid particles of coal combustion products that are collected at the bottom of the boiler.

As part of the conversion process, a large “gyp storage dome” was constructed on site. The recycling numbers at Cross are dramatic. In 2000, more than 64,600 tons of gypsum were made available to the cement companies. The following year that number was 68,210 tons, and last year it rose to 166,214 tons. This product doesn’t travel far by truck, going to Holcim, Lafarge and Giant Cement in the nearby Holly Hill and Harleyville areas.

In addition, Winyah Station produces 50,000 tons of the heavier bottom ash. “As a bottom-ash supplier to block manufacturers, we’ve managed to capture almost all of the lightweight concrete block business in lower South Carolina,” Edens said. Santee Cooper retained CAST Minerals, a West Virginia-based company, to process and market an excellent

Dry Silo Fly Ash Facts at Santee Cooper

- There are 140 pounds of fly ash in 1 yard of concrete.
- There are 50,000 pounds of fly ash per truck load.
- One truck load of fly ash = 357 cubic yards of concrete.
- 2002 shipments = 1,444,285 cubic yards of concrete, or 4,040 truck loads of fly ash.

Bottom Ash Facts at Santee Cooper

- 5,500 tons of bottom ash = 1 million concrete blocks.
- Shipments in 2002 produced 6 million concrete blocks.
- An average new public school used 250,000 concrete blocks.
- Lightweight blocks produced from Santee Cooper ash went to build 18 new public schools.
- Projected shipments for 2003: 45,000 tons.

bottom ash sand from the Winyah Station that meets specifications for lightweight aggregate. More than 18 schools and colleges in lower South Carolina are using these lightweight blocks in new construction projects.

“We do no trucking,” Edens said. “That is handled by the companies we’re



Mary Hill, a fly ash sampler with Palmetto Bridge Constructors, removes a sample of material from one of the tankers making delivery to the Wando Concrete batch plant, which blends the material into the concrete delivered for pourings on the bridge project. Samples from every delivery are taken and laboratory tested.



Concrete-mixer trucks leave the Wando batch plant with loads of concrete blended for specific delivery points on the project.

doing business with. It's a good arrangement that benefits everyone. This whole process is tremendously good for the environment. We're conserving natural resources and saving landfill space by using coal ash in a useful way. This is a recyclable product these companies need, and we're supplying it from something we don't need."

Edens also said the gypsum produced at Cross Station saves the cement companies money because they previously had to import natural gypsum. The Cross gypsum quality is very consistent as well.

Burning coal produces a lot of electricity in South Carolina. But it's good to know that what remains from this process is being used again. Just look at the new Berkeley High School or St. John's High School in Charleston County



Operator Adam Tiberian shuffles the paperwork that documents each delivery of fly ash and cement, the blending of materials and the dispatch and delivery of concrete to the project's various construction sites.



A load of fly ash from Winyah Station is pumped into a storage silo at Wando Concrete's batch plant. Each tanker carries about 25 tons of fly ash. For the bridge project, that is enough for blending into about 200 yards of concrete.



Operations Manager Kevin Garrick surveys the delivery of cement and fly ash and the dispatch of loaded mixer trucks delivering concrete to the bridge project.

or building projects in Loris and Myrtle Beach. And of course, the most visible and distinctive use of Santee Cooper's combustion product is the new Cooper River bridge in Charleston, under construction and scheduled for completion in 2005.

Of course, recycling is really nothing new at Santee Cooper. Its Give Oil for Energy Recovery, or GOFER, program is the state's largest used motor oil collection program. More than 1 million gallons are annually collected by Santee Cooper from more than 500 locations statewide and safely converted into electric power.

Utilizing coal ash is just another example of how Santee Cooper is helping improve the quality of life in the Palmetto State.

NEW COOPER RIVER BRIDGE: BRINGING COMMUNITIES CLOSER TOGETHER

When it is completed, the Arthur Ravenel Jr. Bridge will be the longest cable-stay span in North America. From diamond tower to diamond tower, the bridge will span 1,546 feet across the Cooper River in connecting the historically rich port city of Charleston with Mount Pleasant, the fastest growing urban center in South Carolina.



“The new bridge will literally bring Charleston and Mount Pleasant closer together and greatly improve the flow of traffic and commerce between these communities,” says Bobby Clair, South

Carolina Department of Transportation’s manager of the Cooper River Bridge Construction Project.

The \$531 million design-build contract for the new bridge is the single

largest transportation infrastructure project in South Carolina’s history. After an extensive selection process, the South Carolina Department of Transportation selected Palmetto Bridge Constructors as

Left: Huge I-beams shape the roadway support for the Arthur Ravenel Jr. Bridge, which will have eight 12-foot wide traffic lanes and one 12-foot wide pedestrian and biking lane.
Above: The 646-foot twin-diamond towers providing support for the new bridge loom over the structures they will replace — the Silas M. Pearman Bridge in the foreground and the John P. Grace Memorial Bridge behind it.

the bridge's design-build contractor. Bringing together the expertise necessary to build such a massive project, Palmetto Bridge Constructors is a joint venture of two major heavy-civil contractors: Tidewater Skanska and HBG Flatiron.



Parsons Brinckerhoff is the designer of record for the project.

With interchanges, high-level approaches, and the main span, the new Cooper River bridge carries travelers for three miles along U.S. Highway 17 from Mount Pleasant onto the Crosstown Connector in Charleston. The mainline bridge accommodates eight 12-foot wide traffic lanes, four lanes traveling northbound and four lanes

traveling southbound. It will also have a 12-foot wide bike and pedestrian lane with incredible views of the Charleston Harbor and the South Carolina Lowcountry.

The new bridge will offer a channel of 1,000 feet and a vertical clearance of 186 feet, 400 feet wider and 36 feet taller than the existing structures. It will take 300,000 cubic yards of concrete, 50,000 tons of reinforcing steel and 40,000 tons of structural steel to build the project.

Built to last 100 years, the new Cooper River bridge has been designed and tested to withstand the known hazards of the Charleston area. Strict seismic criteria have been included in the bridge plans so that it can withstand earthquakes such as the "Great Quake" of 1886, which was estimated at magnitude 7.3 on the Richter scale.

Extensive wind tunnel testing was performed on the bridge design to ensure that it can resist hurricane force winds of up to 190 mph. Artificial rock islands have been built around the two diamond towers to protect them from potential ship impact—such as the time when the Grace Bridge was hit in 1947 by the ship Nicaragua Victory.



Left: Concrete-mixer trucks await departure of the barge that delivers them to mid stream of the Cooper River where their loads of material are pumped to forms for pouring pilings and sections of the structure.

Above: Resembling giant praying mantises, twin pumper units on barges await their loads for pumping concrete up to the forms where the material is poured.

The new bridge is replacing two existing bridges, which are structurally and functionally obsolete. The oldest Cooper River Bridge — named the John P. Grace Memorial Bridge — was the fifth longest cantilever steel truss bridge in the country when it was built in 1929, but that was more than 70 years ago. With only two 10-foot traffic lanes and a load limit of five tons, the Grace Bridge is unable to accommodate two-way traffic or today's large vehicles.

As the area grew, the Silas M. Pearman Bridge was built in 1966. Also built as a cantilever steel truss bridge, this "sister" bridge to the Grace added three traffic lanes — two for northbound traffic and a southbound lane for truck traffic — but does not provide a breakdown lane or a barrier wall between the opposing lanes of traffic.

The mainspan for the Pearman Bridge is only 760 feet, 290 feet shorter than the Grace Bridge's span of 1,050 feet, restricting the river's shipping channel width to 600 feet horizontally and 155 feet vertically — a narrow fit for today's large container ships visiting the South Carolina State Ports Authority's Wando and North Charleston terminals.

After breaking ground in July of 2001, the South Carolina Department of Transportation expects to have traffic moving across the new Cooper River Bridge in 2005, almost a year ahead of schedule.



Workers pour another support column. Releasing up to six cubic yards of concrete from each bucket, the materials are raised into position by one of the 600-foot tower cranes.

C.R. BARD: MAKING ADVANCED HEALTH-CARE PRODUCTS FOR WORLDWIDE MARKET

A hospital stay usually isn't one of life's experiences we look forward to. But when that time comes, and it usually does if we live long enough, we want to be as comfortable as possible.

catheter (KATH-a-ter) n. 1. A slender, hollow tube, as of metal or rubber, inserted into a body passage, vessel or cavity for passing fluids.
— Webster's New World Dictionary

For nearly a century, a firm that has endeavored to ease urinary discomfort in hospital and other health-care situations is C.R. Bard, Inc. This multinational firm, based in Murray Hill, N.J., is a worldwide leader in developing, manufacturing and marketing health-care products that are used for vascular, urological and oncological diagnosis and intervention.

Bard's manufacturing facility in Moncks Corner makes a specialty product used every day by health-care professionals across the globe. That product is the Foley catheter. About 33 percent of Bard's \$1.2 billion in annual revenues comes from urological products.

"The Bard Foley catheter is highly regarded in the medical device industry and we continue to be clear market leaders in this technology," says Plant Manager Ed Larue. "But at Bard and here in Moncks Corner, we're not resting on our laurels. We're keenly aware of the intense



Left: Celebrating 25 Years, this group of C. R. Bard associates are among the 25 who have been employed with the firm's Moncks Corner plant since its startup in 1978. Left to right are (Row 1): Lillian Simmons, Charlene Sligh, Jo Brittle, Fay Kornahrens and Debra Wheeler; (Row 2): Clodis Brown, Pauline Walker, Shelvie Stapleton and Bettye Hollis; (Row 3): Carl Sprouse, Karen Hindman, Frances Mack, Tim Frye, Angileen Brown and Tammy Barnette; and (Row 4): Brenda Morris, John Williams, Verm Mazyck, Janice Hood, Juanita Kinlaw and Jerome Gadsden.

Above: Ed Larue, plant manager of the Moncks Corner facility.



competitiveness of our industry and the changing technology in making this type of product.”

The plant opened in 1978, with C.R. Bard acquiring the building two years later. Today, a work force of approximately 460 is busy making and inspecting hundreds of Foley and non-Foley catheters of various designs, sizes and tip configurations. More than 30 million catheters go out of the door annually. The Berkeley County operation



Faye Pride performs wire pressing of inflation wires to a catheter form.

shows the international aspect of today’s manufacturing environment. Things aren’t always done in one place.

“We produce the fully functional catheters here in Moncks Corner and ship them to Bard facilities for packaging and sterilization,” Larue says. “Our major process line starts with multiple dips of a metal form into a series of latex tanks. There is a succession of further washing, drying, assembly and inspection operations that culminate with the application of a coating to the catheter surface.” These specialized and patented coatings are very important to the hospitals and patients, and the range includes anti-infective coatings, which help prevent urinary tract infections.

Because this product is placed in the human body, having it sterilized and free from germs is critical to the end-use patient. Like other companies making similar products, Bard is regulated by the federal Food and Drug Administration.

The Moncks Corner plant, a 125,000-square-foot facility on 42 acres, operates

five days a week, 24 hours a day. It recently celebrated its 25th anniversary in Berkeley County.

“We have 25 employees working here who’ve been here 25 years,” Larue says. A 13-year veteran of the company, he says a successful manufacturing operation centers on one thing: employees.

“At Bard, it’s all about our employees wherever you go,” says Larue, who left a Bard plant in Massachusetts two years ago to come South. “Fortunately, we’re

“Santee Cooper is very reliable. We make over 150,000 catheters a day, most leaving by truck and some by air freight and boat. We simply can’t afford to be without power.”
— Ed Larue

blessed with great employees. Bard is an excellent company. We maintain a clean working environment and we continue to recruit, attract and maintain a quality work force. We are also ISO 9002 certified, which means our quality system meets international standards.”

Human Resources Manager Sam Elliott says Bard has used Job Service and temporary employees to find employees. New workers spend four to five weeks training on the manufacturing floor prior to assuming production responsibilities.

In addition to its manufacturing work force the plant employs a variety of support personnel who have an array of skill sets, including chemistry and microbiology.

“For example, our technical people really need to understand the properties of latex, because it is the major material used within the overall manufacturing process,” says Elliott. “We, like so many other manufacturers, seek an educated, trainable work force. That’s been a key to our success in Berkeley County.”



Eileen Adams conducts tests of latex material used in manufacturing of catheters.

Elliott says Bard has availed itself of the educational opportunities provided by Trident Technical College. It recently sent six supervisors for training at the North Charleston campus.

“That really worked well,” Elliott says. “We also utilize Trident Tech to train our maintenance technicians. It’s a good resource to have working not just for us,

but for everyone in the Lowcountry.” Bard has a working relationship with the Berkeley County School District, interfacing with youngsters interested in careers in manufacturing.

“The thing that’s important to us as a medical device company,” says Larue, “is that we excel in a specific technology. Along with our traditional

Foley catheter we can produce specialty catheters as well. If there’s a doctor who wants a catheter with a special coating, we can do that. We’re pretty flexible. We can custom manufacture to our valued customers’ needs.”

Not all catheters are made from latex. Some people with allergies may need a latex-free product. Bard also produces latex-free catheters. Product research and development is performed at Bard’s Covington, Ga., facility.

Says Larue, “Research and development is key to our ongoing success in the marketplace, because there are other catheter manufacturers out there offering similar products. We need to have new and exciting products coming out of the pipeline. C.R. Bard is dedicated to investing in R & D and has made significant financial and resource commitment to its growth.”

Larue can cite a number of things the company is doing to keep employees motivated. The company recognizes employees with certificate of achievement awards, distributes movie passes and hands out Wal-Mart gift certificates. Rewards come for reducing scrap, material and quality defects, and for improving efficiencies, safety, and housekeeping. “Most importantly, we continue to focus on quality,” Larue says. “We strive to provide the timely delivery of quality, cost-effective medical devices to our customers.”

“We have to stay competitive,” Larue says. “To do so, a company like

ours has to be cost-effective. In 2002, we implemented over \$800,000 in cost improvements. We meet regularly with our employees and we are constantly communicating with one another to find ways to ensure continuous improvement.”

Bard, one of Santee Cooper’s 32 large industrial customers, is literally located in the shadows of Santee Cooper’s Jefferies Generating Station. Bard consumes approximately 14.2 million kilowatt-hours of electricity annually.

“Santee Cooper is very reliable,” says Larue. “We make over 150,000 catheters a day, most leaving by truck and some by air freight and boat. We simply can’t afford to be without power. We can ill afford to lose a day of production.”

Bard is an outstanding corporate citizen and is active in local community outreach. Bard’s corporate funded programs enabled the Moncks Corner plant to partner with Whitesville Elementary School with an outreach program for special education students. The school recently received \$12,000. The employees are also actively involved

in a fund-raising effort to support the Juvenile Diabetes Research Foundation in the 2003 Walk to Cure Diabetes Campaign.

Bard is certainly equipped in Berkeley County to continue manufacturing its innovative catheters well into the future.

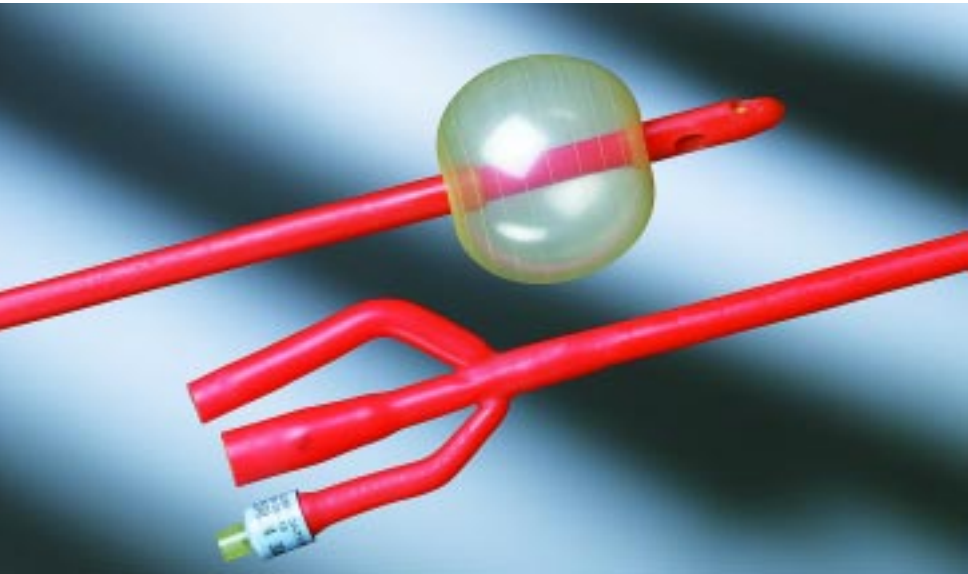
Larue says, “This plant has been a mainstay in the community for over a quarter of a century. Our employees understand the need to manufacture quality products. This, along with remaining cost-effective, will continue to ensure our position as a major employer in the Berkeley County and Charleston areas for years to come.”

Says Elliott, “The operational philosophy here is that we have high performance expectations of our employees. We offer careers here and provide excellent benefits and wages. These aren’t jobs just to pay the bills.”

“The thing that I’ve come to appreciate,” says Larue, “is that we have dedicated, passionate people here. We’re continually raising the bar. You can’t let up. You don’t want to settle for anything less than the best. We’ve developed a mutual trust here with employees, by trying to positively reinforce good results. And we’ve done it all by working together as a team.”



Melaney McFadden applies a sac over the eye snip during the production process. When processing of the catheter is complete, this sac becomes a balloon that can be filled with sterile solution to keep the catheter in place during a surgical procedure.



Close up of the functional ends of an inflated Foley catheter.

C.R. Bard has Long History of Technological Innovation

Ninety-five years ago, Charles Russell Bard began research for the treatment of urinary discomfort. This led to the development of the first balloon catheter in cooperation with Dr. Frederick E.B. Foley. Clinicians embraced the Foley catheter, one of many innovations developed by C. R. Bard Inc. Following is a sampling of other company highlights:

Historical Highlights

- 1907 — Company founder Charles R. Bard begins importing Gomenol, an innocent distillation from New Caledonia eucalyptus trees mixed with pure olive oil. It was the cure-all in 19th century Europe and the “medicine” that relieved urinary discomfort.
- 1923 — C. R. Bard, Inc. formally incorporated.
- 1926 — Charles R. Bard sells company to John F. Willits and Edson L. Outwin for \$18,000.
- 1934 — Bard markets first Foley catheter.
- 1940 — Bard begins distribution of the first American woven catheter.
- 1948 — Bard headquarters moved from New York City to Summit, N. J. Net sales exceed \$1 million.
- 1954 — Dr. Michael E. DeBakey develops the first arterial prosthesis.
- 1957 — Bard produces first sterile-packaged Foley catheters.
- 1958 — Bard develops first bipolar temporary pacing catheters.
- 1960 — Another first for Bard — latex balloon catheters.
- 1961 — Bard begins production of products for cardiology, radiology, and anesthesiology.
- 1963 — Bard produces first disposable pre-packaged catheterization kit. C. R. Bard Inc. becomes publicly owned company.
- 1964 — Bard begins in-plant manufacturing of medical plastic tubing.
- 1966 — Bard acquires United States Catheter & Instrument Co. (USCI), cementing a 25-year association.

- 1968 — Bard is listed on the New York Stock Exchange. Manufacturing plant opens in Murray Hill, NJ.
- 1974 — Bard establishes manufacturing bases in South America and Japan.
- 1975 — Bard acquires William Harvey Research Corp., expanding production of cardiopulmonary products for open-heart and bypass surgery.
- 1978 — Bard acquires rights to first PTCA catheter.
- 1979 — Bard begins manufacture of Gruntzig balloon-tipped angioplasty catheter.
- 1980 — Bard acquires Davol Inc; develops first PTCA-guide catheter.
- 1981 — Bard establishes Puerto Rico and Ireland manufacturing facilities.
- 1982 — Bard develops first PTCA wire.
- 1984 — Bard develops first PDA device.
- 1986 — Bard develops first ASD device. Bard acquires American Endoscopy Inc., now part of Bard Interventional Products Division.
- 1987 — Bard European operation reorganized.
- 1989 — Bard acquires Catheter Technology Corporation, producing GROSHONG catheter. Acquisition also yields BIOPTY Biopsy Instrument, which becomes Bard Access Systems Inc. in 1991.
- 1990 — Bard Electrophysiology formed. Bard Interventional Products, Bard Peripheral Technologies, and Specialty Access Products Business Group created.
- 1993 — Bard acquisitions yield auto transfusion, angioplasty, diagnostic, and urinary incontinence products.
- 1994 — Net sales exceed \$1 billion. Bard acquires Angiomed AG, Cardial S.A., and Vas-Cath, Inc.
- 1995 — Bard Corporate Healthcare Services formed. Bard acquires MedChem Products, Inc. (topical hemostasis), American Hydrosurgical (laparoscopic irrigation products), and GESCO (PICC and midline access products).

STRIPED BASS:

A Legend with Scales and still the “Big Catch” on the Santee Cooper Lakes

The date was Nov. 12, 1941. The remaining six floodgates at the Santee Dam were closed. At last, the long-awaited lakes were being created by the Santee Cooper Hydroelectric and Navigation Project.

This represented the biggest land-clearing endeavor in North American history. The anticipated benefits were many: Low-cost electric power, an inland waterway to and from our state’s capital, flood control and the improvement of public health in combating the deadly mosquito-borne disease malaria.

But hidden within the depths of what was then the Santee Reservoir and the Pinopolis Reservoir (renamed lakes Marion and Moultrie in 1944) a species of migratory fish found a new permanent home.

That fish is the striped bass also commonly referred to as the rockfish. What it did in its new home was something it wasn’t supposed to do, reproduce in a freshwater environment apart from leaving the ocean to go upstream and annually spawn.

The successful reproduction of striped bass in the Santee Cooper Lakes gave South Carolina’s largest freshwater resource an eternal claim to fame: home of the world’s first landlocked striped bass fishery. It’s been said many times—this is one of the greatest fish stories of all time.

In the Beginning

On Feb. 17, 1942, Santee Cooper first generated electric power and on Dec. 2 of that year, the project was declared “substantially complete.” That same year, anglers got the first opportunity to try their luck.

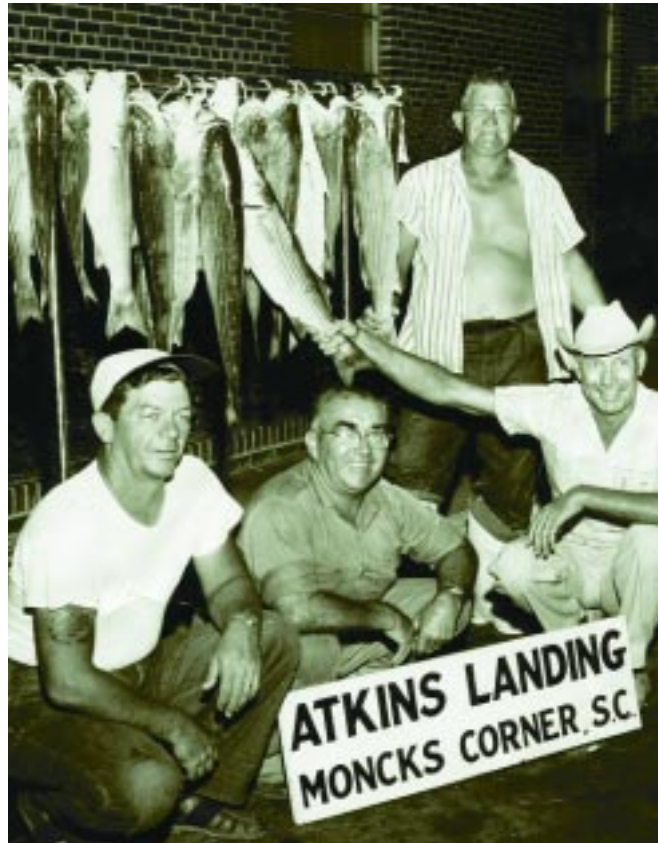
“The State Game and Fish Department, during the past fiscal year, opened the Santee Cooper Lakes to fishing and Chief Alf Richardson reported the issuance of 6,963 fishing permits and the licensing of 69 boats for fishing in the 250 square miles of these newly impounded recreational waters,” Santee Cooper’s 1942 annual report states.

Left: Two avid bass anglers take advantage of the last rays of sunlight on Lake Moultrie in their efforts to pull in a striper or two.
Above: A prized catch, distinctive by its striped pattern that makes its identity unique.



Seven “cruising boats” were placed in service by the department to enforce state fish and game laws on the lakes. Two administration buildings were constructed near Bonneau and Eutaw Springs. It’s obvious a fishing bonanza was anticipated as Richardson wrote in 1942:

“The Santee Cooper Lakes being relatively shallow, as compared with mountain reservoirs, will provide the vast lateral expanses where fish may spawn; where plankton, indispensable to aquatic life, can develop in profusion and where native cereals, that serve as wildlife food, can find luxuriant growth.”



Ted Larrabee, Harry R. Smith, Walter Bryant and "Stringbean" Atkins displayed their string of 19 rockfish caught in Lake Moultrie in August 1958 for a photographer from the Charleston Evening Post.

And great fishing did soon evolve. In 1943, Richardson reported 16,724 permits were issued by his department for fishing in the Santee Cooper Lakes “and that excellent fishing was being enjoyed.”

But in the early days, the striped bass was a no-show fish, upstaged by other species. In Santee Cooper annual reports in the 1940s, the striped bass wasn’t even mentioned.

Fish getting all the publicity were largemouth bass, white and black crappie (or “goggle eye”), warmouth perch, bluegill bream, redbreast bream, jackfish or pike, and the yellow perch or redfin trout. Garfish, carp, mudfish and

suckers, termed “rough fish,” were also mentioned.

Fast forward to 1953. The game and fish department issued 82,498 fishing licenses on the lake, and the annual report that year stated, “It can readily be seen that fishing and recreation at Santee Cooper have developed into quite a private industry, doing a business of more than \$8 million annually.”

And the striped bass was finally getting noticed in Santee Cooper’s official annual publication.

“Trolling for rockfish or striped bass was unusually successful during the past year,” an unknown author penned in the 1953 annual report. “While many of them weighed 20 pounds and over, the average ‘rock’ caught weighed in at 10 pounds.”

Next year’s report contained a condensed story written by Eddie Finlay for Ford Motor Co.’s monthly publication, Ford Times. In that March 1954 issue, Finlay, who worked for what was now called the S.C. Wildlife Resources Department, stated the “rockfish capital is in and around Santee Cooper” and that

the lakes were “some of the best striped bass fishing in America.”

This was also the time that fisheries biologists were first noticing something decidedly different about the Santee Cooper stripers.

“A feature of the striper fishing in Santee Cooper is that the fish are landlocked, or so the fisheries experts are almost convinced,” Finlay wrote. “It was long believed that although the striper was spawned in freshwater, it had to return to saltwater to complete the life cycle and that a fish spending its entire life in freshwater was sterile.

“However, studies carried on by the S.C. Wildlife Resources Department indicate that the rockfish in Santee Cooper are reproducing without ever returning to saltwater. Many stripers coming up the Cooper River get into the Pinopolis Lock near Moncks Corner, but this cannot account for the thousands of fish in the lakes.”

In 1955, state biologists decided to transport 297 Santee Cooper stripers from the lakes to Lake Greenwood. Long-time Berkeley County game warden Mac

Flood and others carefully captured the stripers from the Tailrace Canal, losing only four after the four-hour journey. Lake Greenwood thus began breeding landlocked stripers.

Word continued to get around, as a Feb. 20, 1955 story in the Atlanta Journal and Constitution magazine attests. Written by Joe Stearns, the article’s headline was, “I Tied Into Sea-going Monster at Santee Cooper Lake.”

Stearns stated he’d “never been satisfied with the stories of the whopping big landlocked stripers that cruise these reservoirs looking for arguments.”

On a cold December day, Stearns fished Lake Moultrie. A striper struck his bait, an experience he described as “if you were standing in a railroad yard and a freight train was going at 60 miles an hour, and you reached out and grabbed the bars on the last speeding boxcar—you’d get a pretty good idea.”

Wrote Stearns, “For 20 of the longest minutes I have ever known, it was a tug o’ war. I strained, pulled, perspired and hugged my rod without ever once seeing my opponent. I would have been only mildly surprised if I had hauled up a mule. There were no jumps, no swirls, no anything but the strong, determined resistance.

“Finally, the old striper came reluctantly to the surface. When I saw what I had been fighting, I swallowed my chewing gum. I had never seen so much fish in one place in freshwater. Buck (his fishing partner) whipped the landing net under the monster, groaned under the weight and flopped 22 pounds of mayhem wrapped



No caption was found on this archival photo from the 1950s but the display of his catch and the look of satisfaction on this angler’s face tell it all.

up in fish scales into the boat. The finny warrior thumped the planks with its tail. The bass and I were both stretched out in the bottom of the boat, but only the fish had a wiggle left.”

He said “hundreds of Atlanta fisherman make the trip every year to Santee Cooper for stripers.” As for landing these lunkers, Stearns said, “If you latch on to one like mine, go ahead and fight it and bring it in. Any good doctor can always put your arms back in their sockets.”

The veteran angler concluded his story with, “There is no question about one thing: Santee Cooper today probably has the best freshwater, landlocked striped fishing in the nation. There are reports of 30- and 35-pounders being taken there.”

In 1956, the wildlife resources department reported that 64,000 stripers weighing 470,000 pounds were caught in the lakes. Three years later, that number swelled to an estimated 470,000. That was the peak year, but biologists had anticipated a gradual drop off in the eye-popping catches.

In 1961, the state wildlife department established a striped bass hatchery on the Tailrace Canal near Moncks Corner. The following year 2,640,000 tiny stripers, or “fry,” were stocked in other reservoirs in South Carolina. The hatchery was later expanded, and by 1965, 55 million fry were raised. Biologists Robert Stevens and Jack Bayless conducted groundbreaking work in this area. Striped bass from the Santee Cooper Lakes began reproducing in suitable habitat worldwide.

Jan. 29, 1963 was a big day in the fishing history of the lakes. That’s when legendary NASCAR driver and Cross, S.C. resident—the late DeWayne “Tiny” Lund caught a 55-pound striper on Lake Moultrie, a U.S. record. This record by the 55-year-old Iowa native, who won the Daytona 500 driving car number 55, stood until 1978 when a 59-pounder was caught in Colorado.

The Modern Era of Striper Fishing on the Santee Cooper Lakes

In the ensuing decades no one is more identified with bass fishing than Roland Martin. But did you know, the Santee Cooper Lakes “taught” him much of what he knows?

According to “Wild and Wonderful Santee Cooper Country,” a 1981 book by Pulitzer Prize-winning author W. Horace Carter, Martin’s military service and where he was stationed played a big part in making the man.

“His fishing career began at Santee Cooper while he was serving a hitch in the Army,” Carter stated. “He used his time off from Fort Jackson to perfect his technique, increase his know-how in the art of catching largemouth bass and stripers at Santee in the ‘60s.”

“Santee Cooper is a great place to fish,” Martin said in Carter’s book. “I have had some wonderful experiences fishing there.”

The formation of the Bass Anglers Sportsman Society, or B.A.S.S., helped promote the lakes as a bass mecca. But

challenges lay ahead for the two lakes in the 1980s and 1990s.

In 1982, biologists noticed a non-native species of plant, hydrilla, in lower Lake Marion. Hydrilla and other noxious aquatic weeds such as Brazilian elodea, began giving the lakes lots of problems. They clogged boat propellers, docks and by the mid-1990s, covered about 45,000 acres of the lakes’ 156,000-acre surface area. Although providing cover for smaller bass, the weed infestation didn’t allow them to grow that large.

Action was demanded and the problem was eventually solved by utilizing the sterile Chinese grass carp and environmentally friendly herbicides. Only a few hundred acres remain today.

The lakes have remained a remarkably viable bass fishery. In 1995, B.A.S.S. Times magazine trumpeted “Santee Cooper Stakes Its Claim as Nation’s Best All-Around Bass Fishery” following a major tournament on Lake Marion.

“Stripers are still very important to these lakes,” said Dan Moon, chairman of the Santee Cooper Counties Promotion

Commission, a 35-year-old regional tourism promotion organization based in Santee, S.C. “While catfish may now be the biggest draw nowadays, people still come from far and wide because of the stripers.”

Moon, a popular radio talk show host in Charleston, has been fishing the lakes since he moved to the Lowcountry in the early 1960s. He enjoys all types of fishing, and he considers the thrill of the strike from a hungry striper as still one of the best angling experiences in all of fishdom.

“These lakes have produced a lot of different kinds of fish,” Moon says, “but none more important than the striped bass.”

Miller White, a veteran Berkeley County biologist with the S.C. Department of Natural Resources, was also quoted in Carter’s book about the striper’s ability to not just survive, but thrive, in freshwater. “That discovery... has had more impact on freshwater fishing than any other single fishing innovation in this century,” White said. “It was the beginning of a landlocked striper population. It intrigued other wildlife departments over the nation, and it wasn’t long before striper fry were being hatched, pampered and shipped to other states, and even to foreign countries. It all began at Santee Cooper.”



These two railroad men, J.D. Neal, left, and Rudy Harrington, were featured in The State in 1959, proudly displaying their string of stripers caught at the confluence of the Wateree and Congaree Rivers using cut-shad bait.

FISHING FOR STRIPERS WITH ED, RICHARD & CURTIS

"It's a matter of using the right lure or bait, being in the right spot at the right time and applying the right technique to make the catch."

Striped bass fishing in the modern context is an experience that contrasts dramatically with the stereotype image of lazily spending an afternoon on the lake or at the riverside, wetting a hook, drowning a few worms or crickets and returning home with a string of "keepers."

The modern mode of going after the prized catch of rockfish, commonly known as striped bass, entails a lot of fishing knowledge, technology and horsepower.

"It's a matter of using the right lure or bait, being in the right spot at the right time and using the right technique to make the catch," says experienced angler Ed Riley of Bonneau, who has been going after the prized catch since he was big enough to lift a cane pole and bait a hook. "Having a good boat with a lot of power can also add to your success," he adds. "While I like to go out and



casually search for the stripers, quite often, it's a high-speed chase."

Richard Hill and Curtis Kullnat are two of Riley's striper fishing cohorts who frequent the Santee Cooper lakes and believe in using every advantage available to find and bring home the bass. "We all have fast and powerful boats, a good set of binoculars and communications equipment to help us out," explains Hill.

By constantly scanning the surface of the lake, Riley, Hill and Kullnat spot turbulence in the water's surface and an

assembly of birds feeding on the bait fish stirred-up by the stripers' schooling activity.

"That's when we hold on to everything we've got and go full throttle to reach the schooling location," Kullnat explains. "Then it's all about putting the bait in the water and making the catch while they're in a feeding frenzy."

That process usually doesn't last long and the results may be one or more catches or none at all. "You've got to be on target and get there quickly," says Hill,



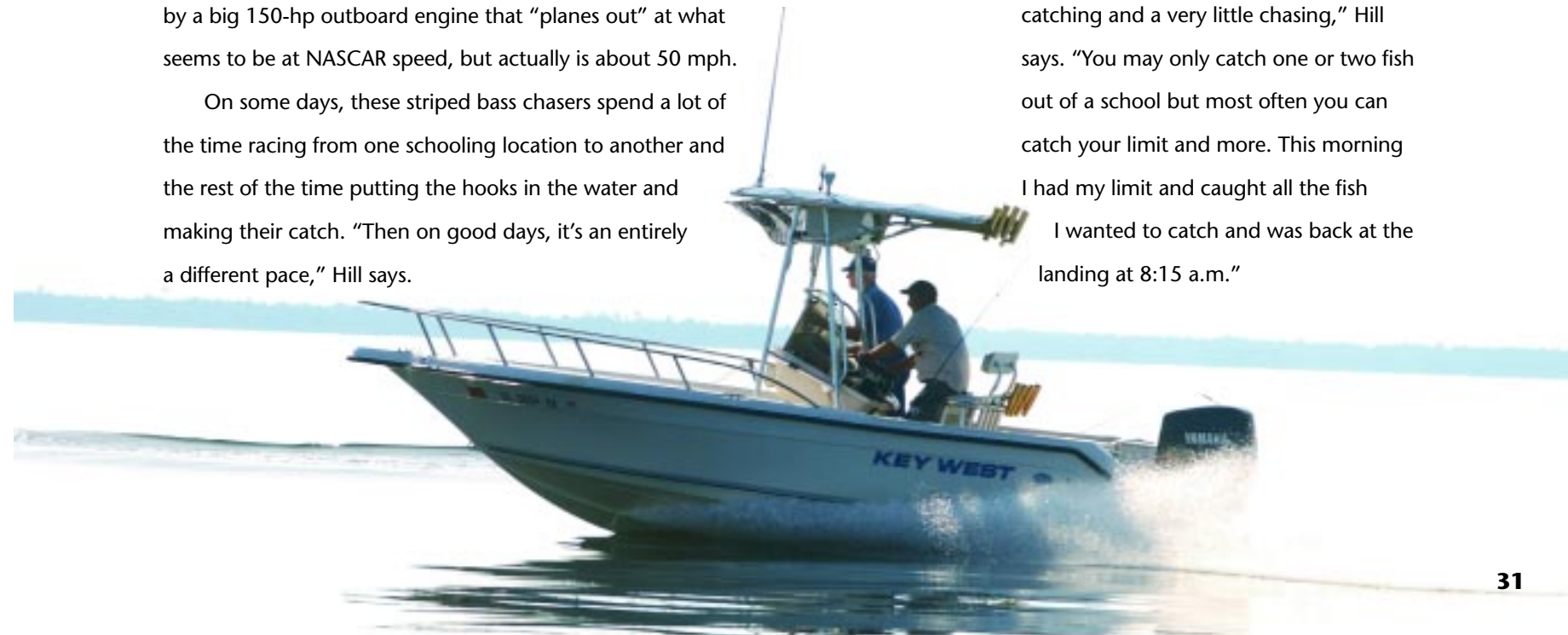
Ed Riley steers his boat to a location where stripers were spotted schooling.

who makes his moves from point to point over Lakes Marion and Moultrie, powered by a big 150-hp outboard engine that "planes out" at what seems to be at NASCAR speed, but actually is about 50 mph.

On some days, these striped bass chasers spend a lot of the time racing from one schooling location to another and the rest of the time putting the hooks in the water and making their catch. "Then on good days, it's an entirely a different pace," Hill says.

"That's when there's a whole lot of catching and a very little chasing," Hill says. "You may only catch one or two fish out of a school but most often you can catch your limit and more. This morning I had my limit and caught all the fish

I wanted to catch and was back at the landing at 8:15 a.m."



Hill says that “when it’s really good,” the fish stay up schooling for 15 to 30 minutes or more. “They may school for 15 to 30 minutes, go down for a few minutes and come right back up over and over again. Or you may find where the stripers are schooling and spend the entire fishing trip within a quarter-mile section of the lake catching fish the whole time.”

Hill says on that the other hand, there are days when the stripers are just not biting or you may never see a school. “That’s when you just appreciate the opportunity of being on the lake and look forward to the next trip out.”

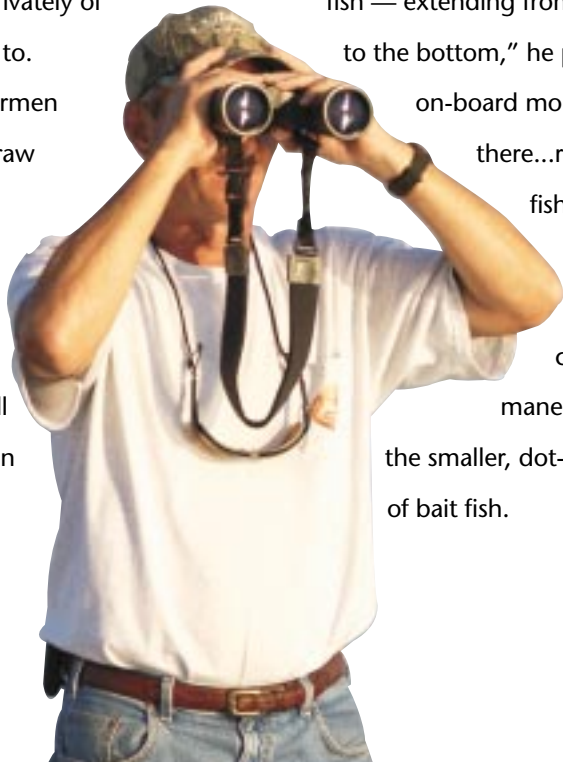
In addition to using high-powered binoculars to spot the potential catch locations for stripers, the avid anglers use their cell phones and marine radios to help put them



Ed Riley holds a nice striper that's not a "keeper," but that's just the fun of fishing, he says. He'll release it with hopes to catch it again next year...or the next.

“on point.”

“Other guys out here generally put out the word when they’re on a school of stripers,” Riley explains. “They’re either on the radio describing what’s happening or give you a cell phone call to inform you privately of what they’re on to. Sometimes fishermen don’t want to draw a crowd, but if they’ve reached or are approaching their limit, they’ll share information with you.”



Sonar depth finders and global positioning satellite (GPS) navigational units are additional high-tech fishing tools.

“For example, someone will tell you they are on the stripers just past the dropoff near the sunken islands or over near the hatchery, but sometimes they’ll share the GPS coordinates, which helps pinpoint the exact location,” Riley points out.

When the fishermen reach the schooling area, their SONAR navigational units tell them more than the depth of the water.

“See there, you can see the bait fish — extending from the surface to the bottom,” he points out on the on-board monitor. “And there...right there are the fish we’re looking for.” Several elongated black masses can be seen maneuvering among the smaller, dot-like amassing of bait fish.

At that point, Riley and his fishing partners grab their rods from the boat-side holders, flip the lures out 30 to 40 feet and let the bucktails or spoons drop down in hopes of attracting the feeding fish.

When the hit is made, it’s all action. Pull and tug. With bended rods, they release line to, let the fish make a run, then reel back their lines to pull their catch closer to the surface. A lot of fight,

a lot of frenzy and the striper finally breaks the surface. If the fish is exhausted by the fight, it’s a matter of reaching with a finger into the open mouth and pulling up the catch.

If the striper is still fighting, they’re scooped up with a catch net and brought on board. If larger than the 21-inch limit, they’re dropped in the cooler, and if they’re “undersized,” they’re immediately released. “I’ll see you maybe next year...or the next,” Riley says.

“Whether you keep them or release them, it’s a real challenge and always more fun that a fellow ought to be allowed,” Riley contends. “You want to return home with a cooler full of stripers and you want to get the big ones, but even if you don’t I wouldn’t want to be doing anything else.”



Richard Hill and Curtis Kullnat cast off both sides of their boat into a spot where they spotted a schooling of rockfish.

NEW SOURCE

Santee Cooper Inks Long-Term Power Agreement with Largest Industrial Customer

Alcoa Mt. Holly and Santee Cooper recently signed a long-term power supply agreement providing for the state-owned electric and water utility to continue as the aluminum manufacturer's source of electricity through 2015.

Alcoa's current agreement was scheduled to end in 2005. The new agreement reflects Alcoa's confidence in the Mt. Holly plant's ability to be competitive in the world aluminum market.

"Energy prices are critical to metals manufacturers, and Santee Cooper's industrial electric rates are among the lowest in the Southeast," said Santee Cooper President and Chief Executive Officer John Tiencken. "This helps us foster economic development by attracting and retaining good-paying jobs and good corporate citizens, such as Alcoa. Working together, we can keep critical manufacturing jobs in the U.S."

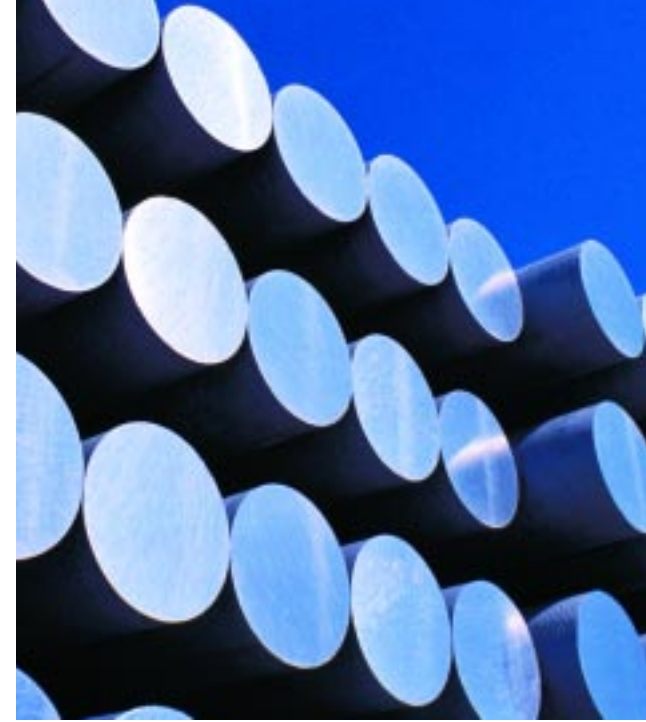
Alcoa Mt. Holly, with a workforce of approximately 630, is one of Santee Cooper's 32 large industrial customers located around the state.

The facility is Santee Cooper's largest industrial customer, accounting for nearly 14 percent of the utility's total annual energy sales.

"This 10-year contract provides Alcoa Mt. Holly with a reliable source of affordable power required in today's global aluminum industry," said Paul Campbell, president of Alcoa's Southeast region. "We have a very positive relationship with Santee Cooper and it's been that way since we began commercial operations in 1980."

The facility, which opened as Alumax of South Carolina, was acquired by Alcoa in 1998. Alcoa Mt. Holly is capable of producing 212,000 metric tons of aluminum annually. The aluminum is produced continuously in reduction cells that require a stable and reliable energy source. With the exception of Hurricane Hugo in 1989, Santee Cooper has supplied the facility's electrical needs without interruption.

"It is important for any utility to continue serving its large customers and



this agreement shows that Alcoa has a tremendous amount of faith in Santee Cooper," said Tiencken. "We will continue concentrating on producing low-cost electric power and delivering the level of customer service all our customers expect and deserve."

Alcoa is the world's leading producer of primary aluminum, fabricated aluminum and alumina, and is active in all major aspects of the industry. Alcoa serves the aerospace, automotive, packaging, building and construction, commercial transportation and industrial markets. In addition to aluminum products and components, Alcoa also markets consumer brands including Reynolds Wrap aluminum foil, Alcoa wheels, and Baco household wraps. The company has 127,000 employees in 40 countries.

LEST WE FORGET...

Taking a Look at the Lakes

The lure of the Santee Cooper lakes has always extended beyond the fantastic fishing opportunities they represent. South Carolina's largest freshwater recreational resource has been an attraction to visitors and sightseers since its very beginning in 1942.

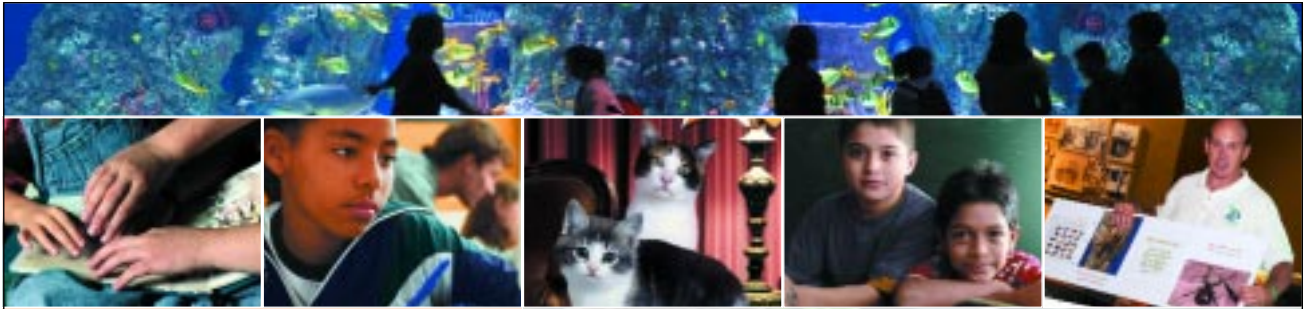
Lakes Marion and Moultrie have enticed visitors and outdoor recreation buffs to the vast reservoirs for fishing, boating and water recreation.

Following completion of construction and the beginning of hydroelectric power generation in 1942, there was an armada of boat traffic, particularly on weekends, taking visitors through the Pinopolis Lock and into Lake Moultrie for a look at the "big blue waters."

They packed into fishing boats, john boats, canoes and larger tour boats to make the voyage that would provide a closeup look at South Carolina's newest recreational resource, and perhaps allow them to scout out a few potential fishing holes for a future visit.

This photo from the early days of operation shows a tour boat jammed with sightseers making a weekend passage through the highest single-lift navigation lock in operation at the time. Dressed in their Sunday best, they were raised by the lock 75 feet from the Tailrace Canal to Lake Moultrie.





**"Who says two friendly
cats can't teach
you something about
the environment?"**

Megan McDuffie
2003 Essay Contest Winner
Myrtle Beach Middle School



Megan McDuffie's winning essay featured two cats who taught humans about living in a home that's environmentally friendly. It's programs like Santee Cooper's Annual Environmental Essay contest, Energy Education Seminars, Math Buddies and Read with a Child that help us reach out to the communities we serve. If you'd like to read Megan's essay or to find out more about our educational programs and see how Santee Cooper works to make life better for everyone in South Carolina, visit the special site listed below.

sclearn.com

Visit www.sclearn.com for more information
on educational outreach programs.

Santee Cooper POWER
Dependable Power. Dependable People.